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Applicants:	RELANDER ET AL.	Confirmation No.:	8087
Serial No.:	09/993,947	Art Unit:	2136
Filed:	November 27, 2001	Examiner:	Zia, Syed
For:	MAINTAINING END-TO-END SYNCHRONIZATION ON A TELECOMMUNICATIONS CONNECTION		

APPEAL BRIEF

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In accordance with 37 CFR 41.37(c)(1), Appellants submit this Brief of Appeal corresponding to the Notice of Appeal filed on January 24, 2007, the period for filing this Brief being extended by one month by the payment of a one-month extension of time.

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1. Real Party in Interest.

By virtue of the Assignment duly recorded at Reel 16926, Frame 270, EADS Secure Networks Oy is the real party in interest.

2. Related Appeals and Interferences.

None

3. Status of Claims.

Claims 1-18, 22-26 and 29 have been rejected under 35 U.S.C. 103(a) as being unpatentable over document "Encrypted Video over TETRA" by Samarakoon et al. (hereafter "Samarakoon") in view of "CRT-Mode Encryption" by Lipmaa et al. (hereafter "Lipmaa") in further view of Kramer et al. (US 6,658,027; hereafter "Kramer").

As a point of clarification, contrary to the assertions of the Final Rejection dated November 17, 2006, at paragraph 20, the rejection of independent claims 13 and 22 was made based on Samarakoon, Lipmaa and Kramer, not simply the Samarakoon reference alone. Thus, claims 20-21 and 28 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Samarakoon, Lipmaa and Kramer in view of ESTI (Radio Equipment and System (RES), Trans-European Trunked Ratio (TETRA), Packet Data Optimized (PDO), Part 1: General Network Design (hereafter "ESTI")). Similarly, claims 19 and 27have been rejected under 35 U.S.C. 103(a) based on Samarakoon, Lipmaa, Kramer and Uhlirz (Concept of a GSM-based Communication System for High-Speed Trains).

4. Status of Amendments.

An Amendment to the claims and specification was filed on January 4, 2006 and duly entered by the Office.

5. Summary of Claimed Subject Matter.

As explained in paragraph [0013], the invention is based on the idea that, if the reproduction delay is increased during a data transmission, such as speech item or call, the frame added to increase the reproduction delay is marked as an extra frame and only the frames not marked as extra frames are counted in the number of frames received at the receiving end; as a result, the extra frames added to increase the reproduction delay will not mix up the frame counter used in end-to-end encryption. Accordingly, there will be no gaps

in decryption or decoding. Additionally, the reproduction delay may be increased during data transmission without causing a disruption in decoding of encrypted data. The application includes four independent claims: 1, 7, 13 and 22.

Independent claim 1 is directed to a method for maintaining end-to-end synchronization on a telecommunications connection transmitting data in frames in real time and using synchronized end-to-end encryption. An initialization vector (IV) value corresponding to a received frame and used in decrypting the frame is defined based on the number of frames received at a receiving end of the telecommunications connection. At least a part of the telecommunications connection is a packet-switched connection (see Figure 1). The claimed method includes increasing the reproduction delay of the data being transmitted by adding one or more extra frames to the frame string being transmitted (See Figure 7).

As explained in connection with Figure 7, one or more extra frames 72 are added to the frame string 75 and the thus obtained frame string 76 is transmitted. The added extra frames 72 are also marked in such a manner that the recipient recognizes them as extra frames and does not count them in the number n of received frames. Thus, an encryption algorithm of the recipient keeps the correct synchronization. In accordance with claim 1, a frame to be added to increase the reproduction delay is marked as an extra frame and only the frames not marked as extra frames are counted in the number of received frames.

Independent claim 7 is directed to an arrangement for maintaining end-to-end synchronization on a telecommunications connection transmitting data in frames in real time and using end-to-end encryption. In the arrangement, at least a part of the telecommunications connection is a packet-switched connection. The arrangement includes means for adjusting the reproduction delay arranged to increase the reproduction delay of the data being transmitted by adding one or more extra frames to the frame string being transmitted (see Figure 7). The means for adjusting the reproduction delay in the terminal equipment (TE) is performed before the filter block 25 in FIG. 2. A frame to be added to increase the reproduction delay can be marked as extra in a manner agreed in advance. The manner of the marking is not significant for the basic idea of the invention. The most important thing is that the receiving party of the telecommunications connection can identify the extra frames. The marking can be done for instance using a special parameter reserved for this purpose that is transmitted in the C-stolen second speech block of the extra frame 72. Each extra frame can be marked or, if several extra frames are transmitted one after the other,

it is also possible to mark only the first extra frame and indicate the number of extra frames following it.

The claimed arrangement of claim 7 also includes means for defining, on the basis of the number of received frames, an initialization vector value corresponding to a frame received at the receiving end of the telecommunications connection and used in decrypting the frame. As explained in connection with Figure 2 and paragraphs [0025]-[0034], when using end-to-end encryption, to prevent the breaking of the encryption, a Key Stream Segment KSS is changed continuously, and each frame is encrypted by its own key stream segment. Accordingly, encryption key stream generators 21 and 27 agree on which key stream segment to use for each frame under the control of synchronization control 23 and 26 using synchronization vectors transmitted between terminals using an in-band signal. The encryption key stream generator (EKSG) 21 and 27 generates the key stream segment (KSS) on the basis of a cipher key (CK) and an initialization vector (IV). The initialization vector is changed after each frame. As explained at paragraph [0033], the task of synchronization control 23 and 26 is to make sure that both ends 20 and 30 know the initialization vector used to encrypt each frame. For the encrypter 20 and decrypter 30 to agree on the value of the initialization vector, a synchronization vector (SV) is transmitted at the beginning of the speech item. The recipient 30 counts the number (n) of frames transmitted after the synchronization vector, and the encryption key stream generator 27 of the recipient 30 generates a new initialization vector IV on the basis of the initialization vector received last and the number of frames. The initialization vector IV counting performed by the recipient is illustrated in Figure 3 that shows a frame string to be transmitted.

Independent claim 7 also requires that the means for adjusting the reproduction delay are arranged to mark the frame to be added to increase the reproduction delay as an extra frame. As a result, the means for defining the initialization vector value are arranged to count only the frames not marked as extra frames in the number of received frames. As explained in paragraph [0043], determining the delay of the IP packet through an IP network requires a compromise. On one hand, a real-time application requires as short an end-to-end delay as possible, thereby indicating that the reproduction delay should be minimized. On the other hand, a long reproduction delay allows a long time for the packets to arrive and thus, more packets can be accepted. Further, as explained at paragraph [0050], according to the invention, the reproduction delay is increased in the receiving end GW or TE of the packet connection PDN during a data transmission, for instance speech item or call, in such a

manner that the frame 72 (see Figure 7) to be added to increase the reproduction delay is marked as an extra frame, and further, in the receiving end of the telecommunications connection, only the frames not marked as extra frames are counted in the number n of received frames so as to obtain the correct value of the initialization vector.

Independent claim 13 is directed to a network element for maintaining end-to-end synchronization on a telecommunications connection transmitting data in frames in real time and using end-to-end encryption. As explained in connection with Figure 1 and at paragraph [0024], the network element may be one within TETRA system or another type of network element.

In the claimed network element of claim 13, an initialization vector value corresponding to a received frame and used in decrypting the frame is defined based on the number of frames received at the receiving end of the telecommunications connection; at least a part of the telecommunications connection is a packet-switched connection. The network element is arranged to increase the reproduction delay of the data being transmitted by adding one or more extra frames to the frame string being transmitted (see Figure 7). The network element of claim 13 is also arranged to mark the frame added to increase the reproduction delay as an extra frame.

Independent claim 22 is directed to a network element for use in a telecommunications connection transmitting data in frames in real time and using a synchronized end-to-end encryption; at least a part of the telecommunications connection is a packet -switched connection. As explained in connection with Figure 1 and at paragraph [0024], the network element may be one within TETRA system or another type of network element. In accordance with independent claim 22, the reproduction delay of the data being transmitted can be increased by adding one or more extra frames to the frame string being transmitted. The claimed network element defines, based on the number of received frames, an initialization vector value corresponding to a received frame and used in decrypting the frame. When the frames added to increase the reproduction delay are marked as extra frames, the network element counts in the number of received frames only the frames that are not marked as extra frames added to increase the reproduction delay.

6. Grounds of Rejection to be Reviewed on Appeal.

A. Whether Samarakoon in view of Lipmaa and Kramer render obvious claims 1-18, 22-26 and 29 under 35 U.S.C. 103(a);

B. Whether Samarakoon, Lipmaa, Kramer and ESTI render obvious claims 20-21 and 28 under 35 U.S.C. 103(a);

C. Whether Samarakoon, Lipmaa, Kramer and Uhlirz render obvious claims 19 and 27 under 35 U.S.C. 103(a).

7. Argument.

Appellants assert that the outstanding rejections (now on appeal by virtue of the concurrently filed Notice of Appeal) are clearly improper in that the Examiner has failed to establish a prima facie case of obviousness against any of the rejected claims.

To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

A prima facie case of obviousness has not been establish by the Examiner because the cited prior art references, analyzed individually or in combination, fail to disclose, teach or suggest all the recited claim features as explained herein. For example, the cited prior art references fail to teach or suggest the claimed increase of the reproducing delay of the data to be transmitted by adding one or more extra frames to the frame string being transmitted, as recited in the rejected claims; additionally, the cited prior art references fail to teach or suggest the claimed marking of a frame to be added to increase the reproduction delay as an extra frame and counting of only the frames not marked as extra frames as the number of received frames, as recited in the rejected claims.

Further, Appellants submit that a prima facie case of obviousness has not been established because the stated motivation to combine the teachings of Samarakoon, Lipmaa and Kramer is insufficient to support an obviousness-type rejection.

A. Claims 1-18, 22-26 and 29 are Patentable Over the Combined Teachings of Samarakoon, Lipmaa and Kramer

Independent claims 1, 7, 13, 22 and their respective dependent claims 2-6 (dependent on base method claim 1), 8-12 (dependent on claim base arrangement claim 7), 14-18

(dependent on base network element claim 13) and 23-26 and 29 (dependent on base network claim 22) are patentable over the combined teachings of Samarakoon, Lipmaa and Kramer.

1. Cited Prior Art Fails to Teach or Suggest All Features of Claimed Method of Independent Claim 1 and Its Dependent Claims 2- 6

To establish a prima facie case of obviousness, the prior art references, when combined, must teach or suggest all the claim limitations. Independent claim 1 recites a method for maintaining end-to-end synchronization on a telecommunications connection, the method comprising "increasing the reproduction delay of the data being transmitted by adding one or more extra frames to the frame string being transmitted; marking a frame to be added to increase the reproduction delay as an extra frame; and counting only the frames not marked as extra frames in the number of received frames."

In response to the previously asserted arguments that Samarakoon fails to teach or suggest the claimed operation and equipment for adding one or more extra frames to the frame string being transmitted and associated resulting operations, the Examiner admitted that Samarakoon fails to teach or suggest: (1) increasing the reproduction delay of the data to be transmitted by adding one or more extra frames to the frame string being transmitted; and (2) counting only the frames not marked as extra frames in the number of received frames (see Office Action dated May 16, 2006, page 4, lines 8-9).

However, the Examiner incorrectly asserted that Lipmaa, when combined with Samarakoon, teaches counting only the frames not marked as extra frames in a number of received frames (May 16, 2006 Office Action, page 4, lines 17-8). Nevertheless, Lipmaa fails to remedy this deficiency of Samarakoon because Lipmaa merely relates to counter-mode encryption. In fact, it should be noted that Lipmaa is completely silent about any frames being transmitted. As a consequence, Samarakoon in combination with Lipmaa fail to disclose, teach or suggest increasing the reproduction delay of the data to be transmitted by adding one or more extra frames to the frame string being transmitted.

The Examiner also incorrectly asserted that Kramer, when combined with Samarakoon and Lipmaa, teaches increasing the reproduction delay of data to be transmitted. However, Kramer fails to remedy the deficiencies of Samarakoon and Lipmaa b ecause Kramer merely relates generally to jitter buffer management. More specifically, Kramer merely discloses that "silence frames" can be inserted into a jitter buffer when certain criteria are satisfied. Kramer, however, fails to disclose, teach or suggest marking a frame to be

added to increase the reproduction delay as an extra frame, and counting only the frames not marked as extra frames in the number of received frames.

Furthermore. if the teachings of Kramer were combined with the teachings of Samarakoon, such that a silence frame could be considered to correspond with the claimed added frames (as argued by the Examiner on page 6, last paragraph of the November 17, 2006 Office Action), there would be no change in the reproduction delay because Samarakoon specifically teaches to reduce the data rate to compensate for the reduced transmission capacity due to added frames.

As a result, the combined teachings of Samarakoon, Lipmaa and Kramer fail to teach or suggest the claimed the method comprising "increasing the reproduction delay of the data being transmitted by adding one or more extra frames to the frame string being transmitted; marking a frame to be added to increase the reproduction delay as an extra frame; and counting only the frames not marked as extra frames in the number of received frames." Accordingly, claims 1-6 are allowable.

2. Cited Prior Art Fails to Teach or Suggest Claimed Arrangement of Independent Claim 7 and Its Dependent Claims 8-12

To establish a prima facie case of obviousness, the prior art references, when combined, must teach or suggest all the claim limitations. Independent claim 7 recites an arrangement for maintaining end-to-end synchronization on a telecommunications connection, the arrangement comprising "means for adjusting the reproduction delay arranged to increase the reproduction delay of the data being transmitted by adding one or more extra frames to the frame string being transmitted... wherein the means for adjusting the reproduction delay are arranged to mark the frame to be added to increase the reproduction delay as an extra frame, whereby the means for defining the initialization vector value are arranged to count only the frames not marked as extra frames in the number of received frames."

In response to the previously asserted arguments that Samarakoon fails to teach or suggest the claimed means for adjusting the reproduction delay arranged of data being transmitted, the Examiner again incorrectly asserted that the combination of Samarakoon and Kramer teach this feature. The Examiner also incorrectly asserted that the combined teachings of Samarakoon and Kramer teach adding one or more extra frames to a frame string being transmitted (see Office Action dated November 17, 2006, page 7, lines 3-7). Thus, the

Examiner incorrectly asserted that Kramer, when combined with Samarakoon, teaches the claimed means for adjusting the reproduction delay.

However, Kramer fails to remedy the deficiencies of Samarakoon because Kramer merely relates generally to jitter buffer management. More specifically, Kramer merely discloses that "silence frames" can be inserted into a jitter buffer when certain criteria are satisfied. Kramer, however, fails to disclose, teach or suggest marking a frame to be added to increase the reproduction delay as an extra frame, and counting only the frames not marked as extra frames in the number of received frames.

Furthermore. if the teachings of Kramer were combined with the teachings of Samarakoon, such that a silence frame could be considered to correspond with the claimed added frames (as argued by the Examiner on page 6, last paragraph of the November 17, 2006 Office Action), there would be no change in the reproduction delay because Samarakoon specifically teaches to reduce the data rate to compensate for the reduced transmission capacity due to added frames.

Further, the Examiner erroneously concluded that Lipmaa, when combined with Samarakoon, teaches counting only the frames not marked as extra frames in a number of received frames. Nevertheless, because Lipmaa merely relates to counter-mode encryption, Lipmaa fails to teach or suggest transmission or reception of frames. As a consequence, Samarakoon in combination with Lipmaa fail to disclose, teach or suggest means for adjusting the reproduction delay of the data to be transmitted by adding one or more extra frames to the frame string being transmitted.

As a result, the combined teachings of Samarakoon, Lipmaa and Kramer fail to teach or suggest the claimed the arrangement comprising "means for adjusting the reproduction delay arranged to increase the reproduction delay of the data being transmitted by adding one or more extra frames to the frame string being transmitted... wherein the means for adjusting the reproduction delay are arranged to mark the frame to be added to increase the reproduction delay as an extra frame, whereby the means for defining the initialization vector value are arranged to count only the frames not marked as extra frames in the number of received frames." Accordingly, claims 7-12 are allowable.

3. Cited Prior Art Fails to Teach or Suggest Claimed Network Element of Independent Claim l3 and Its Dependent Claims 14-18

To establish a prima facie case of obviousness, the prior art references, when combined, must teach or suggest all the claim limitations. Independent claim 13 recites a

network element for maintaining synchronized end-to-end encryption, the network element being arranged "to increase the reproduction delay of the data being transmitted by adding one or more extra frames to the frame string being transmitted, and to mark the frame added to increase the reproduction delay as an extra frame."

In response to the previously asserted arguments that the cited prior art fails to teach or suggest the claimed increase of the reproduction delay of the data being transmitted, the Examiner again incorrectly asserted that the combination of Samarakoon and Kramer teach this feature. The Examiner also incorrectly asserted that the combined teachings of Samarakoon and Kramer teach adding one or more extra frames to a frame string being transmitted (see Office Action dated November 17, 2006, page 8, lines 10-12). Thus, the Examiner incorrectly asserted that Kramer, when combined with Samarakoon, teaches the claimed increase of the reproduction delay by adding one or more extra frames to the frame string being transmitted.

However, Kramer fails to remedy the deficiencies of Samarakoon because Kramer merely relates generally to jitter buffer management. More specifically, Kramer merely discloses that "silence frames" can be inserted into a jitter buffer when certain criteria are satisfied. Kramer, however, fails to disclose, teach or suggest marking a frame to be added to increase the reproduction delay as an extra frame, and counting only the frames not marked as extra frames in the number of received frames.

Furthermore. if the teachings of Kramer were combined with the teachings of Samarakoon, such that a silence frame could be considered to correspond with the claimed added frames (as argued by the Examiner on page 6, last paragraph of the November 17, 2006 Office Action), there would be no change in the reproduction delay because Samarakoon specifically teaches to reduce the data rate to compensate for the reduced transmission capacity due to added frames.

Further, the Examiner erroneously concluded that Lipmaa, when combined with Samarakoon, teaches counting only the frames not marked as extra frames in a number of received frames. Nevertheless, because Lipmaa merely relates to counter-mode encryption, Lipmaa fails to teach or suggest transmission or reception of frames. As a consequence, Samarakoon in combination with Lipmaa fail to disclose, teach or suggest increasing the reproduction delay of the data to be transmitted by adding one or more extra frames to the frame string being transmitted.

As a result, the combined teachings of Samarakoon, Lipmaa and Kramer fail to teach or suggest the claimed network element being arranged "to increase the reproduction delay of the data being transmitted by adding one or more extra frames to the frame string being transmitted, and to mark the frame added to increase the reproduction delay as an extra frame." Accordingly, claims 13-18 are allowable.

4. Cited Prior Art Fails to Teach or Suggest Claimed Network Element of Independent Claim 22 and Its Dependent Claims 23-26 and 29

To establish a prima facie case of obviousness, the prior art references, when combined, must teach or suggest all the claim limitations. Independent claim 22 recites a network, wherein the reproduction delay of the data being transmitted can be increased by adding one or more extra frames to the frame string being transmitted, the network element being arranged to, "when the frames added to increase the reproduction delay are marked as extra frames, to count in the number of received frames only the frames that are not marked as extra frames added to increase the reproduction delay."

In response to the previously asserted arguments that the cited prior art fails to teach or suggest the claimed network element being arranged, when the frames added to increase the reproduction delay are marked as extra frames, to count in the number of received frames only the frames that are marked as extra frames added to increase the reproduction delay, the Examiner again incorrectly asserted that the combination of Samarakoon and Kramer teach this feature (see Office Action dated November 17, 2006, page 9, lines 6-10). Thus, the Examiner incorrectly asserted that Kramer, when combined with Samarakoon, teaches the claimed increase of the reproduction delay by adding one or more extra frames to the frame string being transmitted.

However, Kramer fails to remedy the deficiencies of Samarakoon because Kramer merely relates generally to jitter buffer management. More specifically, Kramer merely discloses that "silence frames" can be inserted into a jitter buffer when certain criteria are satisfied. Kramer, however, fails to disclose, teach or suggest marking a frame to be added to increase the reproduction delay as an extra frame, and counting only the frames not marked as extra frames in the number of received frames.

Furthermore. if the teachings of Kramer were combined with the teachings of Samarakoon, such that a silence frame could be considered to correspond with the claimed added frames (as argued by the Examiner on page 6, last paragraph of the November 17, 2006 Office Action), there would be no change in the reproduction delay because

Samarakoon specifically teaches to reduce the data rate to compensate for the reduced transmission capacity due to added frames.

Further, the Examiner erroneously concluded that Lipmaa, when combined with Samarakoon, teaches counting only the frames not marked as extra frames in a number of received frames. Nevertheless, because Lipmaa merely relates to counter-mode encryption, Lipmaa fails to teach or suggest transmission or reception of frames. As a consequence, Samarakoon in combination with Lipmaa fail to disclose, teach or suggest increasing the reproduction delay of the data to be transmitted by adding one or more extra frames to the frame string being transmitted.

As a result, the combined teachings of Samarakoon, Lipmaa and Kramer fail to teach or suggest the claimed network element being arranged "when the frames added to increase the reproduction delay are marked as extra frames, to count in the number of received frames only the frames that are not marked as extra frames added to increase the reproduction delay." Accordingly, claims 22-26 and 29 are allowable.

5. Deficient Motivation to Combine Teachings of Samarakoon, Lipmaa and Kramer

To establish a prima facie case of obviousness, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Appellants submit that a prima facie case of obviousness has not been established because the stated motivation to combine the teachings of Samarakoon, Lipmaa and Kramer is insufficient to support an obviousness-type rejection.

Specifically, the Examiner asserted that one of ordinary skill in the art would have combined the teachings of Samarakoon and Lipmaa for the rationale as follows:

> "It would have been obvious to one of ordinary skill in the art to use CTR mode [Lipmaa teaching CTR-Mode Encryption] as the block cipher of Samarakoon et al. Samarakoon et al. specify the use of block cipher, but not a specific block cipher. Lipmaa et al. teach the block cipher mode CTR, and in addition a number of advantages, including software efficiency, hardware efficiency, probable security..."

However, nothing in this "statement of motivation" indicates why the prior art would have taught or suggested that Lipmaa's CTR-Mode Encryption techniques should be used for Samarakoon et al. The mere fact that references can be combined or modified does not

render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990)

Further, the Office Action asserted that one of ordinary skill in the art would have been motivated to combine the teachings of Samarakoon and Lipmaa with Kramer because:

> "It would have been obvious to one of ordinary skill in the art, when performing jitter control on a real time transmission as in Kramer et al., to use the inserted frames of Samarakoon et al. as the silence frame of Kramer et al. First, one of skill in the art would recognize that jitter control is important in real-time communication, and Kramer et al. present a system and methods to implement jitter control. Since both Kramer et al. and the combination of Samarakoon et al. implement their respective functions by adding an additional frame, it would be obvious to use the same added frame to perform both functions to reduce communication overhead."

However, this "statement of motivation" is nothing more than hypothetical hindsight reasoning because there is no mention in any of the cited prior art regarding the need to reduce communication overhead in this particular technology. Further, the relevant inquiry is why one of ordinary skill in the art would have been motivated to look to Kramer to modify the teachings of Samarakoon and Lipmaa, not vice versa. Although a prior art device "may be capable of being modified to run the way the apparatus is claimed, there must be a suggestion or motivation in the reference to do so." 916 F.2d at 682, 16 USPQ2d at 1432.).

Accordingly, Appellants submit that the asserted "statements of motivation" are merely statements of hypothetical result formulated by the Examiner based on hindsight analysis of the prior art informed by Appellants' own specification as a roadmap. Therefore, Appellant asserts that no prima facie case of obviousness has been established. Accordingly, claims 1-18, 22-26 and 29 are allowable.

B. Claims 20-21 and 28 are Patentable Over the Combined Teachings of Samarakoon, Lipmaa, Kramer and ESTI

1. Combined Teachings of Prior Art are Deficient

Appellants traverse the obviousness-type rejection of dependent claims 20-21 (dependent on base network element claim 13) and dependent claim 28 (dependent on base network element claim 22) because the Examiner has failed to establish a prima facie case of obviousness. More specifically, and in accordance with the argument explained above with regard to the base claims, a prima facie case of obviousness has not been establish by the Examiner because the cited prior art references, analyzed individually or in combination, fail

to disclose, teach or suggest all the recited claim features as explained herein. Further, Appellants submit that a prima facie case of obviousness has not been established because the stated motivation to combine the teachings of Samarakoon, Lipmaa, Kramer and ESTI is insufficient to support an obviousness-type rejection.

Rejected claims 20 and 21 recite a network element for maintaining synchronized end-to-end encryption, the network element being arranged "to increase the reproduction delay of the data being transmitted by adding one or more extra frames to the frame string being transmitted, and to mark the frame added to increase the reproduction delay as an extra frame," by virtue of their dependence on independent claim 13. Similarly, rejected claim 28 recites a network element wherein the reproduction delay of the data being transmitted can be increased by adding one or more extra frames to the frame string being transmitted, the network element being arranged to, "when the frames added to increase the reproduction delay are marked as extra frames, to count in the number of received frames only the frames that are not marked as extra frames added to increase the reproduction delay," by virtue of its dependency on independent claim 22.

In response to the previously asserted arguments that the cited prior art fails to teach or suggest the claimed increase of the reproduction delay of the data being transmitted, the Examiner again incorrectly asserted that the combination of Samarakoon and Kramer teach this feature. The Examiner also incorrectly asserted that the combined teachings of Samarakoon and Kramer teach adding one or more extra frames to a frame string being transmitted (see Office Action dated November 17, 2006, page 8, lines 10-12). Thus, the Examiner incorrectly asserted that Kramer, when combined with Samarakoon, teaches the claimed increase of the reproduction delay by adding one or more extra frames to the frame string being transmitted.

However, Kramer fails to remedy the deficiencies of Samarakoon because Kramer merely relates generally to jitter buffer management. More specifically, Kramer merely discloses that "silence frames" can be inserted into a jitter buffer when certain criteria are satisfied. Kramer, however, fails to disclose, teach or suggest marking a frame to be added to increase the reproduction delay as an extra frame, and counting only the frames not marked as extra frames in the number of received frames.

Furthermore. if the teachings of Kramer were combined with the teachings of Samarakoon, such that a silence frame could be considered to correspond with the claimed added frames (as argued by the Examiner on page 6, last paragraph of the November 17,

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As a result, the combined teachings of Samarakoon, Lipmaa and Kramer fail to teach or suggest the claimed network elements recited in dependent claims 20-21 and 28 by virtue of their respective dependencies on independent claims 13 and 22. Accordingly, claims 20-21 and 28 are allowable.

2. Deficient Motivation to Combine Teachings of Samarakoon, Lipmaa, Kramer and ESTI

To establish a prima facie case of obviousness, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Appellants submit that a prima facie case of obviousness has not been established because the stated motivation to combine the teachings of Samarakoon, Lipmaa, Kramer and ESTI is insufficient to support an obviousness-type rejection.

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Further, the Office Action asserted that one of ordinary skill in the art would have been motivated to combine the teachings of Samarakoon and Lipmaa with Kramer because:

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However, this "statement of motivation" is nothing more than hypothetical hindsight reasoning because there is no mention in any of the cited prior art regarding the need to reduce communication overhead in this particular technology. Further, the relevant inquiry is why one of ordinary skill in the art would have been motivated to look to Kramer to modify the teachings of Samarakoon and Lipmaa, not vice versa. Although a prior art device "may be capable of being modified to run the way the apparatus is claimed, there must be a suggestion or motivation in the reference to do so." 916 F.2d at 682, 16 USPQ2d at 1432.).

The Examiner further asserted that one of ordinary skill in the art would have looked to incorporate the teachings of ESTI because:

> "It would have been obvious to one of ordinary skill in the art, given a network configuration as in ESTI, to have the network element be a base station. The network element in question in Samarakoon et al. concerns only the TETRA elements of the network, hence it would be obvious to consider the transmitter/receiver to reside at the TETRA boundary. One of ordinary skill in the art would recognize, given the network configuration as in case 3 of ESTI, that the network element would reside in the base station, as the base station provides the gateway between TETRA and the PDN."

Again, nothing in this "statement of motivation" indicates why the prior art would have taught or suggested that a hypothetical combination of Samarakoon, Lipmaa and Kramer should be provided in a gateway or base station. The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990)

Accordingly, Appellants submit that the asserted "statements of motivation" are merely statements of hypothetical result formulated by the Examiner based on hindsight

analysis of the prior art informed by Appellants' own specification as a roadmap. Therefore, Appellant asserts that no prima facie case of obviousness has been established. Accordingly, claims 20-21 and 28 are allowable.

C. Claims 19 and 27 are Patentable Over the Combined Teachings of Samarakoon, Lipmaa, Kramer and Uhlirz

1. Combined Teachings of Prior Art are Deficient

Appellants traverse the obviousness-type rejection of dependent claim 19 (dependent on base network element claim 13) and dependent claim 27 (dependent on base network element claim 22) because the Examiner has failed to establish a prima facie case of obviousness. More specifically, and in accordance with the argument explained above with regard to the base claims, a prima facie case of obviousness has not been establish by the Examiner because the cited prior art references, analyzed individually or in combination, fail to disclose, teach or suggest all the recited claim features as explained herein. Further, Appellants submit that a prima facie case of obviousness has not been established because the stated motivation to combine the teachings of Samarakoon, Lipmaa, Kramer and Uhlirz is insufficient to support an obviousness-type rejection.

Rejected claim 19 recites a network element for maintaining synchronized end-to-end encryption, the network element being arranged "to increase the reproduction delay of the data being transmitted by adding one or more extra frames to the frame string being transmitted, and to mark the frame added to increase the reproduction delay as an extra frame," by virtue of its dependence on independent claim 13. Similarly, rejected claim 27 recites a network element wherein the reproduction delay of the data being transmitted can be increased by adding one or more extra frames to the frame string being transmitted, the network element being arranged to, "when the frames added to increase the reproduction delay are marked as extra frames, to count in the number of received frames only the frames that are not marked as extra frames added to increase the reproduction delay," by virtue of its dependency on independent claim 22.

In response to the previously asserted arguments that the cited prior art fails to teach or suggest the claimed increase of the reproduction delay of the data being transmitted, the Examiner again incorrectly asserted that the combination of Samarakoon and Kramer teach this feature. The Examiner also incorrectly asserted that the combined teachings of Samarakoon and Kramer teach adding one or more extra frames to a frame string being

transmitted (see Office Action dated November 17, 2006, page 8, lines 10-12). Thus, the Examiner incorrectly asserted that Kramer, when combined with Samarakoon, teaches the claimed increase of the reproduction delay by adding one or more extra frames to the frame string being transmitted.

However, Kramer fails to remedy the deficiencies of Samarakoon because Kramer merely relates generally to jitter buffer management. More specifically, Kramer merely discloses that "silence frames" can be inserted into a jitter buffer when certain criteria are satisfied. Kramer, however, fails to disclose, teach or suggest marking a frame to be added to increase the reproduction delay as an extra frame, and counting only the frames not marked as extra frames in the number of received frames.

Furthermore. if the teachings of Kramer were combined with the teachings of Samarakoon, such that a silence frame could be considered to correspond with the claimed added frames (as argued by the Examiner on page 6, last paragraph of the November 17, 2006 Office Action), there would be no change in the reproduction delay because Samarakoon specifically teaches to reduce the data rate to compensate for the reduced transmission capacity due to added frames.

Further, the Examiner erroneously concluded that Lipmaa, when combined with Samarakoon, teaches counting only the frames not marked as extra frames in a number of received frames. Nevertheless, because Lipmaa merely relates to counter-mode encryption, Lipmaa fails to teach or suggest transmission or reception of frames. As a consequence, Samarakoon in combination with Lipmaa fail to disclose, teach or suggest increasing the reproduction delay of the data to be transmitted by adding one or more extra frames to the frame string being transmitted.

Uhlirz merely teaches on a potential, paint-to-multipoint architecture for GSM-based communication systems for high-speed trains. However, Uhlirz, analyzed in combination with the other cited prior art references, fails to teach or suggest the claimed network element for maintaining synchronized end-to-end encryption, the network element being arranged "to increase the reproduction delay of the data being transmitted by adding one or more extra frames to the frame string being transmitted, and to mark the frame added to increase the reproduction delay as an extra frame," as recited in rejected claim 19. Similarly, Uhlirz, analyzed in combination with the other cited prior art references, fails to teach or suggest a network element wherein the reproduction delay of the data being transmitted can be increased by adding one or more extra frames to the frame string being transmitted, the

network element being arranged to, "when the frames added to increase the reproduction delay are marked as extra frames, to count in the number of received frames only the frames that are not marked as extra frames added to increase the reproduction delay," as recited in rejected claim 27.

As a result, the combined teachings of Samarakoon, Lipmaa, Kramer and Uhlirz fail to teach or suggest the claimed network elements recited in dependent claims 19 and 27 by virtue of their respective dependencies on independent claims 13 and 22. Accordingly, claims 19 and 27 are allowable.

2. Deficient Motivation to Combine Teachings of Samarakoon, Lipmaa, Kramer and Uhlirz

To establish a prima facie case of obviousness, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Appellants submit that a prima facie case of obviousness has not been established because the stated motivation to combine the teachings of Samarakoon, Lipmaa, Kramer and ESTI is insufficient to support an obviousness-type rejection.

Specifically, the Examiner asserted that one of ordinary skill in the art would have combined the teachings of Samarakoon and Lipmaa for the rationale as follows:

> "It would have been obvious to one of ordinary skill in the art to use CTR mode [Lipmaa teaching CTR-Mode Encryption] as the block cipher of Samarakoon et al. Samarakoon et al. specify the use of block cipher, but not a specific block cipher. Lipmaa et al. teach the block cipher mode CTR, and in addition a number of advantages, including software efficiency, hardware efficiency, probable security..."

However, nothing in this "statement of motivation" indicates why the prior art would have taught or suggested that Lipmaa's CTR-Mode Encryption techniques should be used for Samarakoon et al. The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990)

Further, the Office Action asserted that one of ordinary skill in the art would have been motivated to combine the teachings of Samarakoon and Lipmaa with Kramer because:

> "It would have been obvious to one of ordinary skill in the art, when performing jitter control on a real time transmission as in Kramer et al., to use the inserted frames of Samarakoon et al. as the silence frame of Kramer et al. First, one of skill in the art would recognize that jitter control is important in

> real-time communication, and Kramer et al. present a system and methods to implement jitter control. Since both Kramer et al. and the combination of Samarakoon et al. implement their respective functions by adding an additional frame, it would be obvious to use the same added frame to perform both functions to reduce communication overhead."

However, this "statement of motivation" is nothing more than hypothetical hindsight reasoning because there is no mention in any of the cited prior art regarding the need to reduce communication overhead in this particular technology. Further, the relevant inquiry is why one of ordinary skill in the art would have been motivated to look to Kramer to modify the teachings of Samarakoon and Lipmaa, not vice versa. Although a prior art device "may be capable of being modified to run the way the apparatus is claimed, there must be a suggestion or motivation in the reference to do so." 916 F.2d at 682, 16 USPQ2d at 1432.)

The Examiner further asserted that one of ordinary skill in the art would have been motivated to apply the teachings of Uhlriz to the hypothetical combination of Samarakoon, Lipmaa and Kramer because "[i]t would have been obvious for one of ordinary skill in the art to take the communication system taught in claims 25, 26, 17, and 18—which is a trunked radio system by definition (the TR in TETRA standing of trunked radio) – and to use it in the role Uhlriz as a dispatcher workstation."

At the outset, it must be noted that the "statement of motivation" is improperly considering claims 25, 26, 17 and 18 as the subject matter to be hypothetically modified. This is wrong for two reasons: (1) the standard requires evaluating whether it would have been obvious to modify the prior art (here, Samarakoon, Lipmaa and Kramer) not the claimed subject matter (2) the rejection at hand is of dependent claims 19 and 27 (which depend from claims 25-26 and 17-18 respectively, but have nothing more to do with the rejection or its prima facie case. Further, nothing in this "statement of motivation" indicates why the prior art would have taught or suggested that a hypothetical combination of Samarakoon, Lipmaa and Kramer should be provided in the role of a dispatcher workstation. The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990)

Accordingly, Appellants submit that the asserted "statements of motivation" are merely statements of hypothetical result formulated by the Examiner based on hindsight analysis of the prior art informed by Appellants' own specification as a roadmap. Therefore,

Appellant asserts that no prima facie case of obviousness has been established. Accordingly, claims 19 and 27 are allowable.

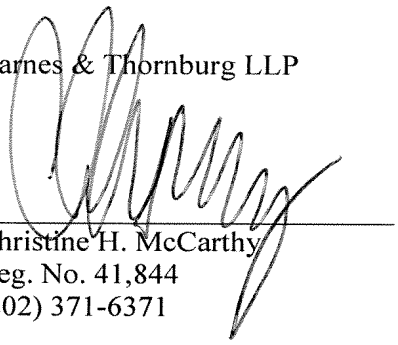
Accordingly, the combined teachings of the cited prior art fail to teach or suggest the claimed invention. Thus, claims 1-29 are patentable over the cited prior art.

Based on the foregoing, Appellants submit that claims 1-29 are patentable over the cited prior art and allowable. Therefore, it is respectfully requested that the Board of Appeals return a decision concurring with

It is respectfully requested that, if necessary to effect a timely response, this paper be considered as a Petition for an Extension of Time sufficient to effect a timely response and shortages in other fees, be charged, or any overpayment in fees be credited, to the Account of Barnes & Thornburg LLP, Deposit Account No. 02-1010 (44655/282888 DN).

Respectfully submitted,

Barnes & Thornburg LLP



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Date: April 24, 2007

8. Claims Appendix.

1. (Previously Presented) A method for maintaining end-to-end synchronization on a telecommunications connection transmitting data in frames in real time and using synchronized end-to-end encryption, wherein an initialization vector value corresponding to a received frame and used in decrypting the frame is defined on the basis of the number of frames received at the receiving end of the telecommunications connection, and wherein at least a part of the telecommunications connection is a packet-switched connection, the method comprising:

increasing the reproduction delay of the data being transmitted by adding one or more extra frames to the frame string being transmitted;

marking a frame to be added to increase the reproduction delay as an extra frame; and

counting only the frames not marked as extra frames in the number of received frames.

2. (Original) A method as claimed in claim 1, wherein the reproduction delay is increased in the receiving end of the packet-switched connection.

3. (Original) A method as claimed in claim 1, wherein the packet-switched connection uses an Internet protocol.

4. (Original) A method as claimed in claim 1, wherein the telecommunications connection belongs to the TETRA system.

5. (Original) A method as claimed in claim 1, wherein the extra frame added to increase the reproduction delay comprises a stolen speech block, and said marking is done in the stolen speech block.

6. (Original) A method as claimed in claims 1, wherein the encryption is done using a key stream segment generated using the initialization vector.

7. (Previously Presented) An arrangement for maintaining end-to-end synchronization on a telecommunications connection transmitting data in frames in real time and using end-to-end encryption, wherein at least a part of the telecommunications connection is a packet-switched connection, the arrangement comprising:

means for adjusting the reproduction delay arranged to increase the reproduction delay of the data being transmitted by adding one or more extra frames to the frame string being transmitted; and

means for defining on the basis of the number of received frames an initialization vector value corresponding to a frame received at the receiving end of the telecommunications connection and used in decrypting the frame;

wherein the means for adjusting the reproduction delay are arranged to mark the frame to be added to increase the reproduction delay as an extra frame, whereby the means for defining the initialization vector value are arranged to count only the frames not marked as extra frames in the number of received frames.

8. (Original) An arrangement as claimed in claim 7, wherein the means for adjusting the reproduction delay reside in the receiving end of the packet-switched connection.

9. (Original) An arrangement as claimed in claim 7, wherein the packet-switched connection uses an Internet protocol.

10. (Original) An arrangement as claimed in claim 7, wherein the telecommunications connection belongs to the TETRA system.

11. (Original) An arrangement as claimed in claim 7, wherein the extra frame added to increase the reproduction delay comprises a stolen speech block, and the means for adjusting the reproduction delay are arranged to do said marking in the stolen speech block.

12. (Original) An arrangement as claimed in claim 7, wherein the encryption is done using a key stream segment generated using the initialization vector.

13. (Previously Presented) A network element for maintaining end-to-end

synchronization on a telecommunications connection transmitting data in frames in real time and using end-to-end encryption, wherein an initialization vector value corresponding to a received frame and used in decrypting the frame is defined on the basis of the number of frames received at the receiving end of the telecommunications connection, and wherein at least a part of the telecommunications connection is a packet-switched connection, the network element being arranged:

to increase the reproduction delay of the data being transmitted by adding one or more extra frames to the frame string being transmitted, and

to mark the frame added to increase the reproduction delay as an extra frame.

14. (Original) A network element as claimed in claim 13, wherein the network element resides in the receiving end of the packet-switched connection.

15. (Original) A network element as claimed in claim 13, wherein the extra frame added to increase the reproduction delay comprises a stolen speech block, and the network element is arranged to do said marking in the stolen speech block.

16. (Original) A network element as claimed in claim 13, wherein the packet-switched connection uses an Internet protocol.

17. (Original) A network element as claimed in claim 13, wherein the telecommunications connection belongs to the TETRA system.

18. (Original) A network element as claimed in claim 13, wherein the encryption is done using a key stream segment generated using the initialization vector.

19. (Original) A network element as claimed in claim 17 or 18, wherein the network element is a TETRA dispatcher workstation.

20. (Original) A network element as claimed in claim 13, wherein the network element is a base station.

21. (Previously Presented) A network element as claimed in claim 13, wherein the

network element is a gateway.

22. (Previously Presented) A network element for use in a telecommunications connection transmitting data in frames in real time and using a synchronized end-to-end encryption, wherein at least a part of the telecommunications connection is a packet - switched connection, in which case the
reproduction delay of the data being transmitted can be increased by adding one or more extra frames to the frame string being transmitted, the network element being arranged:

to define on the basis of the number of received frames an initialization vector value corresponding to a received frame and used in decrypting the frame, and

when the frames added to increase the reproduction delay are marked as extra frames, to count in the number of received frames only the frames that are not marked as extra frames added to increase the reproduction delay.

23. (Original) A network element as claimed in claim 22, wherein the extra frame added to increase the reproduction delay comprises a stolen speech block, and said marking is in the stolen speech block.

24. (Original) A network element as claimed in claim 22, wherein the packet-switched connection uses an Internet protocol.

25. (Original) A network element as claimed in claim 22, wherein the telecommunications connection belongs to the TETRA system.

26. (Original) A network element as claimed in claim 22, wherein the encryption is done using a key stream segment generated using the initialization vector.

27. (Original) A network element as claimed in claim 25 or 26, wherein the network element is a TETRA dispatcher workstation.

28. (Original) A network element as claimed in claim 22, wherein the network element is a base station.

29. (Original) A network element as claimed in claim 22, wherein the network element is a mobile station.

9. Evidence Appendix.

None

10. Related Proceedings Appendix.

None